

Sr isotope constraints on the origin of the mineralizing fluids from Cantung and Mactung skarn-hosted tungsten deposits, Yukon-NWT, Canada

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Cantung and Mactung are tungsten-bearing skarn deposits located in the eastern margin of the Selwyn basin, on the Yukon-Northwest Territories border, Canada. The tungsten-bearing mineral at Cantung and Mactung is a scheelite. These deposits are hosted in a sedimentary sequence consisting of alternations of carbonate and siliciclastic rocks ranging in age from Late Proterozoic to early Paleozoic. The orebodies at Cantung and Mactung are spatially associated with Cretaceous-aged monzogranitic plutons of the Tombstone-Tungsten plutonic belt. In addition to these granitic plutons, numerous dykes are found near the orebodies, including lamprophyre dykes at Cantung.

There is a broad agreement on the relationship between tungsten mineralization and crustal derived felsic magmas. However, the potential contribution of mafic magma may be considered at Cantung due to the presence of lamprophyre dykes. In this context, this study seeks to determine whether there is a mafic component in the magma associated with mineralization at Cantung and Mactung since both are related to the same plutonic belt. To do this, we will compare the Sr isotopic signature of scheelite hosted in clastic units underlying the skarn orebodies with those of other local lithologies including the granitic plutons and the lamprophyre dykes in the case of Cantung. These scheelite crystals are expected to be representative of the least modified magmatic fluid. The results aim to constrain the nature of tungsten-rich fluids in Cantung and Mactung, and the processes involved in mineralization.

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